

AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 47

JUNKERS AIRPLANE "G 24"
All-Metal Commercial Airplane

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JUNKERS AIRPLANE "G 24." *

All-Metal Commercial Airplane.

The Junkers triple-propeller commercial giant airplane was constructed in 1924 and given over to traffic with the beginning of the year 1925. In the autumn of this year, G 24's were flying on nearly all the Central European air-traffic lines in regular service.

The "G 24" constitutes a further development of the "F 13," being constructed on the same principles. It is an all-metal low-wing monoplane with cantilever wings. Wings and fuselage are covered with corrugated sheet duralumin, which assists greatly in absorbing and distributing the stresses.

The triple-engine type combines the characteristic advantage of the momentless propeller thrust of the central engine with the added security of the two additional engines. In this arrangement, the structural drag is kept down by installing the side engines in the wings, with streamlined cowling so as to allow a smooth air flow. The arrangement of the propellers is such that pieces flying from a broken propeller cannot strike any vital part of the airplane, which is not the case in the tandem arrangement.

The stalling of the central engine, of course does not impair the maneuverability or ease of steering. Special disposi-

*From a circular published by the Junkers Flugzeugwerk, A.G., of Dessau, Germany.

tions have been made for the retention of the maneuverability in the event of the stalling of a side engine. The more than 50% reserve energy of the power plant assures the ability to continue flying with either engine stopped.

The principle of sectional construction of the wing was adopted from the F 13 and extended, in the "G 24" to the fuselage, the supporting structure for the central engine, and the whole wing sections supporting the side engines. This method of construction enables the employment of a larger personnel on the work up to the final assembling and also facilitates transportation and the replacement of damaged parts.

For the convenience of the passengers, the utilizable portions of the inside of the fuselage has been considerably extended toward the rear. The passengers do not have to remain in prescribed positions, as in other airplanes, as equilibrium is maintained by the adjustment of the stabilizer from the pilot room during flight. This method has proved entirely satisfactory from the first.

A special advantage of Junkers airplanes resides in the possibility of replacing the landing gear by floats or skis in a short space of time. This is of great practical importance.

The floats are divided into a number of water-tight compartments and, in order to obtain the greatest possible safety, the displacement of each float alone is sufficient to support the weight of the whole airplane. They are made entirely of

aluminum, like the rest of the airplane. Large manholes are provided for the inspection of the interior.

The float struts are attached to removable intermediate wing sections, while the wheel landing gear is attached only to the fuselage.

A leather-covered easy chair next to a window is provided for each passenger, while an aisle furnishes opportunity for moving about. Opportunity for communicating with the pilot is afforded by a door, through a window in which the altimeter, air-speed meter, and other instruments can be read by the passengers. Nets are provided for the hand baggage, while the larger packages are carried in the baggage room, near which the wash room and toilet are located. Every passenger is supplied with a map on which the flight line is drawn.

The central section is the foundation for the whole airplane structure. It receives the principal loads and moments. The advantage of the low wing is here manifest, in that, in the event of hard landings and the possible loss of the landing gear, it affords the best protection to the cabin and consequently to the passengers.

The pilot room (Fig. 1) contains the instruments required for navigation and the control of the engine. The airplane is provided with dual control, so that the pilots can relieve each other on long flights. The pedals for working the rudder are visible near the steering columns. The device for adjusting

the stabilizer to the changing load and likewise that for adjusting the rudder in the event of the stalling of one of the side engines are actuated by wheels between the pilots' seats which do not show in the picture. Tabulation with reference numbers follows:

1. Compass.
2. Gyroscopic inclinometer.
3. Air-speed meter.
4. Altimeter.
5. Revolution counters for the three engines.
6. Ignition switches.
7. Ignition timing.
8. Starting magneto.
9. Throttles.
10. Fuel cocks.
11. Shutter levers for regulating temperature of radiator water.
12. Elec. distance thermometers showing temp. of radiators.
13. Oil-pressure manometers.
14. Grease cups for water pumps.
15. Fuel gauges.
16. Longitudinal inclinometer.
17. Rudder-bar pedals.

The terminal bulkhead of the fuselage (as seen in Fig. 2 from the baggage room) is secured to framework by screw caps.

The picture also shows the system of bulkheads which, together with the outer covering of corrugated duralumin, absorbs all the fuselage stresses.

A damaged engine can be quickly removed and replaced by another. In special cases it is, moreover, possible to remove the complete wing section, with the engine and its mounting.

The landing gear (Fig. 3) consists of steel struts faired with sheet dural to lessen the structural drag. It can be easily removed by removing bolts and turning the bayonet fastenings 90° . The well-known strong Junkers shock absorbers are used, which have proved their worth by years of service on the worst landing places. They are housed in sheet dural for protection from dirt and the weather, as well as for aerodynamic reasons. Large disk wheels and balloon tires are used, with a breaking strength of 20 metric tons.

The "G 24" is built in sections of such dimensions as to be easily loaded on ordinary trucks (Fig. 4). These parts can be quickly assembled at their destination.

Characteristics and Performances (Landplane)

Engines: Three 230 HP. Junkers Llla, 700 HP.

Propeller drive: Direct.

Fuel tanks: In wing.

Fuel capacity: Normal, 6 tanks, 1300 liters 343.4 gal.

Fuel: for long flights, 12 tanks, 2600 liters (686.8 gal.)		
Oil supply	105 "	(27.7 ")
Span	28.50 m	93.5 ft.
Length	15.25 "	50.0 "
Height	5.50	18.0 " (seaplane 6 m = 19.7 ft.)
Wing area	89.00 m ²	958.0 sq.ft.
Weight empty	3800 kg	8378 lb. (seaplane 4150 kg = 9149 lb.)
Useful load	2200 "	4850 " (seaplane 1850 kg = 4079 lb.)
Full load	6000 "	13228 "
Wing loading	67.5 kg/m ²	13.83 lb./sq.ft.
Power "	8.7 kg/HP	18.92 lb./HP.
Maximum speed near ground	175.0 km/h	108.7 M.P.H.
Cruising speed	155.0 km/h	96.3 M.P.H. (seaplane 150 km/h = 93.2 M.P.H.)
Landing speed under full load, 105.0 km/h		65.2 M.P.H.
Fuel consumption when cruising, about	120 kg/h	264.6 lb./hr.
Flight duration,	11 or 22 hours.	

Translation by Dwight M. Miner,
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